DETAILED ACTION

Examiner's Amendment

1.   An examiner's amendment to the record appears below. Should the changes and/or
additions be unacceptable to applicant, an amendment may be filed as provided by 37
CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no
later than the payment of the issue fee.

2.   Authorization for this examiner's amendment was given in a telephone interview with
Marianne M. Downing (Reg. No. 42,870) on June 18, 2009.

3.   The application has been amended as follows:

A LISTING OF THE CLAIMS:

    This listing of claims replaces all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

    Claims 1 – 27 (Cancelled)

28. (Previously Presented) A method for managing data that may be replicated from one or
more volumes of data that are part of a first volume group on a first computer system having

a first internal logical volume, and first filesystem, the method comprising the computer-
executed steps of:

discovering logical information related to the one or more volumes of data that are part
of the first volume group on the first computer system;

creating a map of the logical information to physical devices on the first computer
system, the map defining a first logical configuration comprising:

information identifying one or more devices associated with one or more physical
volumes containing the data, including device serial number, physical address of the
device, volume group, logical volume name, file type, and mount point;

information providing definition and structured layout of the first volume group, first internal
logical volumes and first file system on the first computer system;

using the map to create a second volume group on a second computer system where
the logical configuration of the second volume group is identical to the first logical configuration
of the first volume group, including identical volume layout and file system structure as defined
by mapping information originally built on the first computer system;

using the map to reconstruct on the second computer system the internal logical
volumes and file systems of the first computer system; and

mounting a duplicate of the one or more volumes of data of the first computer system to
the second volume group of ~~on~~ the second computer system.

29. (Previously Presented) The method of claim 28, wherein the first computer has a first
operating system and wherein the second computer has a second operating system, wherein
the first and second operating systems are selected from the group consisting of IBM AIX, Sun
Solaris, and HP UX, and the computer-executed steps may be performed substantially
independent of which operating system is selected from the group.

30. (Currently Amended) The method of claim 28[29], wherein the map is configured as
a flat file that is converted into a tree structure and further comprising the computer-executed
step of using the tree structure to verify the accuracy of the information related to the map of the
first volume group and the other logical information associated with the first computer system.

31. (Previously Presented) The method of claim 30, wherein the tree structure is converted back into a map that is sent to the second computer system.

32. Cancelled

33. (Currently Amended) The method of claim 28[32], further comprising the computer-executed steps of:

establishing one or more mirrored copies of data that are copies of one or more volumes of data that are part of the first volume group; and

separating the one or more mirrored copies of data from the respective one more volumes of data.

34. (Previously Presented) The method of claim 33, further comprising the computer-executed step of mounting the separated one or more mirrored copies of data on the first or second computer system using the second volume group.

35. (Previously Presented) The method of claim 34, wherein the first and second computer systems share a data storage system, where the first volume group and the second volume group are both part of the data storage system.

36. (Previously Presented) The method of claim 34, further comprising the computer-executed step of:

dismounting the separated one or more mirrored copies from the second computer system.

37. (Previously Presented) The method of claim 33, further comprising the computer-executed step of:

backing up the separated one or more mirrored copies of data to a backup storage system in operable communication with the first and second computer systems .

38. (Previously Presented) The method of claim 37, further comprising the computer-executed step of:

restoring one or more volumes of data from the backup storage system or from the one or more mirrored copies of data that are copies of the one or more volumes of data that are part of the first volume group.

39. (Previously Presented) The method of claim 33, wherein the respective one or more volumes of data that are part of the first volume group on the first computer system are further associated with a first software application.

40. (Previously Presented) The method of claim 39, wherein a second software application is provided on the second computer system and the separated one or more mirrored copies of data on the second computer system are associated with the second software application.

41. (Previously Presented) The method of claim 40, further comprising the computer-executed step of:
backing up the separated one or more mirrored copies of data to a backup storage system in operable communication with at least one of the first and second computer systems .

42. (Previously Presented) The method of claim 41, wherein the second software application has an associated database and the step of backing up the separated one or more mirrored copies of data to the backup storage system includes backing up the associated database.

43. (Previously Presented) The method of claim 42, wherein there is a set of information associated with the database, the set of information comprising at least one type of information selected from the group consisting of tablespaces, archive logs, redo logs, and control files, and wherein at least some of the set of information associated with the database is backed up to the backup storage system during the backup step.

44. (Currently Amended) The method of claim 43, further comprising the step of:
restoring, from the separated one or more mirrored copies of data, the respective one or more volumes of data associated with the separated one or more mirrored copies of data,[data

,] and wherein at least some of the set of information associated with the database is used during this step.

45. (Previously Presented) A computer system for managing data that may be replicated from one or more volumes of data, the computer system comprising:

a data storage system including a plurality of storage devices;

first and second computer systems in communication with the data storage system, the first computer system having a first operating system and the second computer system having a second operating system, wherein the first computer system has data that may be replicated from one or more volumes of data that are part of a first volume group on the first computer system; and

a backup storage system in operable communication with the data storage system and the first and second computer systems, the backup storage system comprising computer-executable logic that enables the method steps of:

discovering logical information related to the one or more volumes of data that are part of the first volume group on the first computer system;

creating a map of the logical information to physical devices on the first computer system the map defining a first logical configuration comprising:

information identifying the devices associated with one or more physical volumes containing the data, including device serial number, physical address of the device, volume group, logical volume name, file type, and mount point; and,

information providing definition and structured layout of the first volume group, first internal logical volumes and first file systems on the first computer system;

using the map to create a second volume group on a second computer system , where the logical configuration of the second volume group is identical to the first logical configuration of the first volume group, including identical volume layout and file system structure as defined by mapping information originally built on the first computer system; and

using the map to reconstruct on the second computer system the internal logical volumes and file systems of the first computer system; and

mounting a duplicate of the one or more volumes of data of the first computer system to the second volume group of the second computer system having a second operating system.

46. (Previously Presented) The system of claim 45, wherein the first and second operating systems are selected from the group consisting of IBM AIX, Sun Solaris, and HP UX, and the computer-executed steps may be performed substantially independent of which operating system is selected from the group.

47. (Currently Amended) The system of claim 45[46], wherein the map is configured as a flat file that is converted into a tree structure and further comprising the computer-executed step of using the tree structure to verify the accuracy of the information related to the map of the first volume group and the other logical information associated with the first computer system.

48. (Previously Presented) The system of claim 47, wherein the tree structure is converted back into a map that is sent to the second computer system.

49. Cancelled.

50. (Currently Amended) The system of claim 45[49], further comprising the computer-executed steps of:

establishing one or more mirrored copies of data that are copies of one or more volumes of data that are part of the first volume group; and

separating the one or more mirrored copies of data from the respective one more volumes of data.

51. (Previously Presented) The system of claim 50, further comprising the computer-executed step of mounting the separated one or more mirrored copies of data on the first or second computer system using the second volume group.

52. (Currently Amended) The system of claim 45[51], wherein the first and second computer systems share the data storage system, where the first volume group and the second volume group are both part of the data storage system.

53. (Previously Presented) The system of claim 51, further comprising the computer-executed step of:

dismounting the separated one or more mirrored copies from the second computer system.

54. (Previously Presented) The system of claim 50[49], further comprising the computer-executed step of:

backing up the separated one or more mirrored copies of data to the backup storage system.

55. (Previously Presented) The system of claim 50, further comprising the computer-executed step of:

restoring one or more volumes of data from the backup storage system or from the one or more mirrored copies of data that are copies of the one or more volumes of data.

56. (Previously Presented) A program product for use with a data storage system having a plurality of storage devices and which is in communication with first and second computer systems, the program product being for management of data and being comprised of:

computer-executable logic contained on a computer-readable storage medium and which is configured for causing the following computer-executed steps to occur:

establishing one or more mirrored copies of data that are copies of one or more volumes of data that are part of a first volume group on a first computer system having a first operating system;

separating the one or more mirrored copies of data from the respective one more volumes of data;

discovering logical information related to the one or more volumes of data that are part of the volume group on the first computer system;

creating a map of the logical information to physical devices on the first computer system, the map defining a first logical configuration comprising:

information identifying the devices associated with one or more physical volumes containing the data, including device serial number, physical address of the device, volume group, logical volume name, file type, and mount point; and

information providing definition and structured layout of first volume group, first internal logical volumes and first file systems on the first computer system;

using the map to create a second volume group on a second computer system, where the second logical configuration of the second volume group is identical to the first logical configuration of the first volume group, including identical volume layout and file system structure as defined by mapping information originally built on the first computer system;

using the map to reconstruct on the second computer system the internal logical volumes and file systems of the first computer system; and

mounting a duplicate of the one or more mirrored copies of data of the first computer system to the second volume group of the second computer system.

57. (Previously Presented) The program product of claim 56, wherein the map further comprises: information identifying the one or more separated mirrored copies of the data; and information identifying the physical address(es) of the mirrored copies.

58. (Previously Presented) The program product of claim 56, wherein first computer has a first operating system and wherein the second computer has a second operating system, wherein the first operating system is different from the second operating system.

59. (Previously Presented) The method of claim 28, wherein the map further comprises at least one set of information selected from the group consisting of information relating to one or more filesystems associated with the volumes of data, device serial number, physical address, volume group, logical volume name, file type, and mount point.

60. (Previously Presented) The method of claim 29, wherein the first operating system is different from the second operating system.

61. (Previously Presented) The method of claim 29, wherein the first operating system is substantially the same as the second operating system.

62. (Previously Presented) The method of claim 28, wherein the first computer system is a separate and distinct computer system from the second computer system.

63. (Previously Presented) The method of claim 28, further comprising creating volume group, logical volume, and file system objects on the second computer system.

64. (Previously Presented) The method of claim 33, wherein the map further comprises: information identifying the one or more separated mirrored copies of the data; and information identifying the physical address(es) of the mirrored copies.

65. (Previously Presented) The computer system of claim 45, wherein the first operating system is different from the second operating system.

66. (Previously Presented) The computer system of claim 45, wherein the first operating system is substantially the same as the second operating system.

67. (Previously Presented) The computer system of claim 45, wherein the first computer system is a separate and distinct computer system from the second computer system.

68. (Currently Amended) The system ~~method~~ of claim 50, wherein the map further comprises: information identifying the one or more separated mirrored copies of the data; and information identifying the physical address(es) of the mirrored copies.

Response to Arguments

4.   The Applicants' arguments and amendments filed on April 20, 2009 have been fully

considered and are persuasive.

Allowable Subject Matter

5.   *Claims 28-31, 33-48 and 50-68* are allowed. The claims indicated include limitations that

the prior arts of record do not appear to teach or render obvious, hence they are

allowed.

6.   The following is an examiner's statement of reasons for allowance:

As presented in the previous Office Action, Kleiman et al. (US006574591B1) discloses,

"The `generate image stream` procedure 203 may also generate one or more block-lists

that specify where storage blocks from the source file system are included in the image

stream. The block-lists can indicate which storage blocks include one or more block

number (BN) pointers. The data read from the source file system includes one or more

block number (BN) pointers. The `generate image stream` procedure 203 can also

include a second block-list that can be used to map blocks in the image stream to a

second storage block arrangement for the destination file system" (Kleiman '591, col.5,

lines 6-15). Hence, Kleiman teaches of block-lists (i.e., Applicants' map) indicating

which storage blocks from the source file system (i.e., Applicants' physical devices on

the first computer) are associated with the one or more block number (BN) pointers (i.e.,

Applicants' logical information).

Also presented in the previous Office Action, Kleiman et al. (US006604118B2) discloses,

"Select a storage image 220, in response to a first file system (or a snapshot thereof) to

have an operation performed thereon. Form an image stream 230 in response to the

storage image 220. Perform an operation on the image stream 230, such as backup or

restore within the first file system, or copying or transfer to a second file system"

(Kleiman '118, col.14, lines 10-18). Hence, Kleiman teaches of selecting a storage

image (i.e., Applicants' first volume group) of the first file system (i.e., Applicants' first file

system) and copying or transferring (i.e., Applicants' creating) to a second file system

(i.e., Applicants' second operating system) on a second file server.

Also presented in the previous Office Action, Barton et al. (US006023584) discloses,

"FIG. 2 is a flow chart illustrating the general flow performed for the installation and

execution of a computer program according to the principles of the present invention.

Block 26 represents the computer booting an operating system from a first data storage

device. Block 28 represents the computer mounting a first data storage device as one

half of a mirrored volume. Block 30 represents the computer mounting a second data

storage device as the other half of the mirrored volume. Block 32 represents the

computer synchronizing the mirrored volume by copying data from the first data storage

device to the second data storage device. At some time during this process, but before

synchronization is complete, the mirrored volume can be accessed by users, as

indicated by Block 34, which represents a computer program being executed from the

mirrored volume. Block 36 represents the computer dismounting or removing the first

data storage from the mirrored volume, after synchronization has been completed"

(Barton, col.4, lines 23-40). Hence, Barton teaches of synchronizing the mirrored

volume (implying that the logical information between the two volumes are identical) by

copying data from the first data storage device (i.e., Applicants' first volume group) to the

second data storage device (i.e., Applicants' second volume group).

However, the prior arts of record fail to teach or suggest individually or in combination as

stated in the independent claims for *"creating a map of the logical information to physical*

devices on the first computer system, the map defining a first logical configuration

comprising: information identifying one or more devices associated with one or more

physical volumes containing the data, including device serial number, physical address

of the device, volume group, logical volume name, file type, and mount point; and" and

"*using the map to create a second volume-group on a second computer system where*

the logical configuration of the second volume group is identical to the first logical

configuration of the first volume group, including identical volume layout and file system

structure as defined by mapping information originally built on the first computer system;"

and in combination with other limitations as set forth in the independent claims, as well

as Applicants' arguments presented on pages 16-26 of the After Non-Final Amendment

filed on April 20, 2009. In the fore mentioned amendment, the Applicants argued,

"Applicants note again, for the third consecutive Office Action response, that the Kleiman

'591 reference expressly and clearly teaches opposite to (and thus away from) claim

28's limitations requiring that the second volume group have the same logical

configuration as the first volume group (including all the particulars specified in claim 28,

e.g., identical volume layout, identical file system structure, etc.)" (pg.18).

Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany

the issue fee. Such submissions should be clearly labeled "Comments on Statement of

Reasons for Allowance."

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Thomas Duong whose telephone number is 571/272-3911. The

examiner can normally be reached on M-F 7:30AM - 4:00PM. If attempts to reach the

examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava

can be reached on 571/272-7304. The fax phone numbers for the organization where

this application or proceeding is assigned are 571/273-8300 for regular communications

and 571/273-8300 for After Final communications.

/Thomas Duong/

Patent Examiner, Art Unit 2445

June 26, 2009

/VIVEK SRIVASTAVA/

Supervisory Patent Examiner, Art Unit 2445